Space Weather Forecast

Issued on Thursday, 22 August 2024 at 00:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Minor to Moderate flares expected, slight chance of Strong flares, risk reducing slightly. Slight chance of G1/Minor Storms from Days 1-2 (22-23 Aug). Chance of exceeding S1/Minor Radiation Storm.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate, with two Moderate-class recorded in the last 24 hours, the peak flare from a large active region in the southeast at 21/220UTC.

There are thirteen regions on the visible disc. A large region in the far northwest is now almost rotated around the northwest limb. Another large region now centre disc in the south has shown some consolidation and growth in its lead and trailer portions, with a corresponding reduction in intermediate spots in recent hours. A further large region in the southeast has shown some growth in its leading portion and maintains some magnetic complexity. The other sunspot regions are comparatively smaller or less complex, and either stable or in slight decay.

A filament lift-off near centre disc occurred around 21/1700UTC and may have produced a CME with an Earth directed component. Relevant coronagraph imagery is currently awaited in order to conduct an analysis of this event.

Solar Wind / Geomagnetic Activity: The solar wind continued in a slow regime. The solar wind speed was at low levels throughout. The Interplanetary Magnetic Field was weak, but touched into moderate levels towards the end of the period. The north-south component varied weakly but was often southward directed. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate-class flares are expected with a slight chance of Strong flares, however the departure of a complex region should see a slight dip in daily risks.

Solar Wind /Geomagnetic Activity: The geomagnetic forecast is of lower-than-average confidence in detail for this period. A CME occurring around 17/1030UTC has a small chance of giving glancing impacts early on Day 1 (22 Aug). A filament lift-off near centre disc occurred around 21/1700UTC and is awaiting relevant imagery to conduct an analysis.

Some coronal hole fast wind influence is likely early on Day 1 (22 Aug), perhaps combining with the CME from 17 August. Fast wind influence may then continue into Day 2 (23 Aug)

Conditions are expected to be largely unsettled to active (Kp3-Kp4) with a chance of G1/minor storm intervals Days 1-2 (22-23 Aug), with potential CME and HSS features. In the absence of any further enhancement conditions are expected to return to predominately quiet levels (Kp0-2) through Day 3 (24 Aug).

Energetic Particles / Solar Radiation: Solar radiation is likely to persist at background levels, however there is a chance of exceeding the S1/Minor solar radiation storm level should any notable flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	25	25	20	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	75	70	65	60
Very Active	R3 to R5 X	No	20	15	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	5	5	5	5
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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